



LAWRENCE
LIVERMORE
NATIONAL
LABORATORY

The Autonomous Pathogen Detection System (APDS)

J. Morris, J. Dzenitis

October 1, 2004

Counterintelligence Quarterly

Disclaimer

This document was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor the University of California nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or the University of California. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or the University of California, and shall not be used for advertising or product endorsement purposes.

The Autonomous Pathogen Detection System (APDS)

Shaped like a mailbox on wheels, it's been called a bioterrorism "smoke detector." It can be found in transportation hubs such as airports and subways, and it may be coming to a location near you.

Formally known as the Autonomous Pathogen Detection System, or APDS, this latest tool in the war on bioterrorism was developed at Lawrence Livermore National Laboratory to continuously sniff the air for airborne pathogens and toxins such as anthrax or plague.

The APDS is the modern day equivalent of the canaries miners took underground with them to test for deadly carbon dioxide gas. But this canary can test for numerous bacteria, viruses, and toxins simultaneously, report results every hour, and confirm positive samples and guard against false positive results by using two different tests. The fully automated system collects and prepares air samples around the clock, does the analysis, and interprets the results. It requires no servicing or human intervention for an entire week.

Unlike its feathered counterpart, when an APDS unit encounters something deadly in the air, that's when it begins singing, quietly. The APDS unit transmits a silent alert and sends detailed data to public health authorities, who can order evacuation and begin treatment of anyone exposed to toxic or biological agents. It is the latest in a series of biodefense detectors developed at DOE/NNSA national laboratories.

The manual predecessor to APDS, called BASIS (for Biological Aerosol Sentry and Information System), was developed jointly by Los Alamos and Lawrence Livermore national laboratories. That system was modified to become BioWatch, the Department of Homeland Security's biological urban monitoring program. A related laboratory instrument, the Handheld Advanced Nucleic Acid Analyzer (HANAA), was first tested successfully at LLNL in September 1997.

Successful partnering with private industry has been a key factor in the rapid advancement and deployment of biodefense instruments such as these. The APDS technology has been licensed and is currently undergoing commercialization.

This work was performed under the auspices of the U. S. Department of Energy by University of California, Lawrence Livermore National Laboratory under contract No. W-7405-Eng-48.



The APDS operating near a ticketing counter at San Francisco International Airport.